



# MONTANA FISH, WILDLIFE & PARKS

## Fisheries Division Federal Aid Job Progress Report

### Montana Statewide Fisheries Management

#### Federal Aid Project Number: F-113

July 1, 2018 – June 30, 2019

Project Title: Montana Statewide Fisheries Management

Job Title: (3140 Kootenai River Drainage Fisheries Management)

#### Abstract:

This was the fifteenth year of the surveys. In 2018, 443 anglers obtained bull trout permits/catch cards. By August 1, 2019, we received 319 catch cards/surveys (72%) from anglers. Nearly 89 percent of the anglers that said they fished at least one day were from Montana, as were 93 percent of all catch card holders.

We estimated that 997 bull trout were caught at Lake Koocanusa during the 2018 season. The estimated total harvest calculated from surveyed anglers was 84 bull trout. Even after harvest was re-instated in 2016, anglers continued to harvest at a very low rate and much below the USFWS sub permit allowable harvest of 1,140 bull trout.

For the 2018 season, the mean length of bull trout caught (23.5"; range 10" - 33") was similar to other years. The mean length of bull trout harvested (27.7"; range 16" - 31") was similar to other years and showed anglers targeted larger bull trout for harvest.

A 25-year dataset suggests a trend relationship exists between the number of bull trout redds and angling regulations at Koocanusa. In addition, recent BC regulations include more restrictive limits (Bull trout release from Nov 1 through March 31 in Koocanusa and Kootenay River; No bull trout <75 cm). With that in mind, MFWP determined to request a one bull trout harvest per year starting the 2016 season.

We found 16 technical violations in 2018-2019; 14 catch cards were not notched for harvested bull trout and 2 catch cards were not signed. Though not egregious, the 14 catch cards not notched is troubling. We will remind anglers in the future to accurately complete their catch cards and appropriately notch the catch card upon harvest of a bull trout.

Over the years, we developed a management strategy for the Lake Koocanusa bull trout recreational fishery that is more conservative than the limits of the Authority statutes set by USFWS sub permit TE-07753 for this population. As a result, regulations have been modified from two bull trout per year to catch and release and back to one bull trout per year based on the gathered information.

# **Angler Survey of Experimental Recreational Bull Trout Fishery for Lake Koocanusa, Montana through the 2018 Season.**

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**MONTANA FISH,  
WILDLIFE & PARKS**

**August 2019**

## CONTENTS

CONTENTS.....	2
LIST OF TABLES.....	3
LIST OF FIGURES.....	4
SUMMARY .....	5
INTRODUCTION .....	7
BACKGROUND .....	7
METHODS.....	7
RESULTS.....	9
Bull Trout Catch Card/Survey Returns .....	9
Angler Demographics.....	9
Fishing Pressure Estimates.....	9
Harvest and Catch Estimates .....	10
Catch Versus Harvest Length Estimates .....	12
Bull Trout Redd Counts .....	13
Catch Card Violations.....	15
CONCLUSION.....	15
LITERATURE CITED .....	16

## LIST OF TABLES

Table 1. Bull trout season angling pressure estimates calculated from catch card and survey results for Lake Koocanusa through the 2018 season.....	10
Table 2. Estimated bull trout harvest (known harvest) and estimated catch (known catch) for Lake Koocanusa through the 2018 season. ....	11
Table 3. Estimated annual bull trout caught and angler days per bull trout for anglers fishing in Lake Koocanusa through the 2018 season. ....	12

## LIST OF FIGURES

Figure 1. Estimated number of anglers and percent of respondents that fished for bull trout at Lake Koocanusa, Montana through the 2018 season. ....	10
Figure 2. Length categories of bull trout harvested and released during the 2018 season from Lake Koocanusa, Montana.....	13
Figure 3. Bull trout redd counts for the Wigwam River drainage, British Columbia, Canada by Koocanusa bull trout regulation. ....	14
Figure 4. Bull trout redd counts for Grave Creek, Montana by Koocanusa bull trout regulation. ....	14

## SUMMARY

In 2004, the U.S. Fish and Wildlife Service authorized limited sport fishing for bull trout *Salvelinus confluentus* at Hungry Horse Reservoir, South Fork Flathead River and Lake Koocanusa as requested by Montana Fish, Wildlife & Parks after those fisheries were deemed to have reached recovery goals. A portion of the permit conditions called for a bull trout permit and catch card system, an angler survey, and development of educational information pertaining to these new fisheries.

This was the fifteenth year of the catch card surveys. During the 2018 license year, 443 anglers obtained bull trout permits/catch cards for Lake Koocanusa. By August 2019, we received 319 catch cards and/or surveys (72% return) from anglers. Nearly 89 percent of angler respondents that said they fished for bull trout were Montana residents, as were 93 percent of all catch card holders.

We estimated that 997 bull trout were caught at Lake Koocanusa during the 2018 season. The estimated total harvest calculated from all surveyed anglers was 84 bull trout (91.6% release rate). Even after harvest was re-instated in 2016, anglers harvested at a very low rate, much below the USFWS sub permit allowable harvest of 1,140 bull trout.

For the 2018 season, the mean reported length of bull trout caught (23.5"; range 10" - 33") was similar to other years. The mean length of bull trout harvested (27.7"; range 20" - 31") was similar to other years as well and showed anglers targeted larger bull trout for harvest.

A 25-year dataset suggests a trend relationship exists between the number of bull trout redds and angling regulations at Koocanusa. In addition, bull trout angling in the British Columbia portion of the Lake Koocanusa/Kootenay River/Elk River system had relatively liberal harvest limits. Therefore, even though harvest and redd count numbers did not approach permit thresholds, MFWP adjusted regulations after 2011 to one per year harvest and after 2012 to catch and release. Recent BC regulations include more restrictive limits and with that in mind, MFWP requested a one bull trout harvest per year starting in the 2016 season

We found 16 technical violations; 14 catch cards were not notched for harvested bull trout and 2 catch cards were not signed. Though not egregious, the 12 catch cards not notched is troubling. We will remind anglers in the future to remember to accurately complete their catch cards and appropriately notch the catch card upon harvest of a bull trout.

Over the years, MFWP developed a management strategy for the Lake Koocanusa bull trout recreational fishery that is more conservative than the limits of the Authority statutes set by USFWS sub permit TE-07753 for this population. As a result, regulations have been modified from two bull trout per year to catch and release and back to one bull trout per year based on the information gathered.

Based on information available, we believe the return to a limited bull trout harvest (one per year) is appropriate. We will continue require a catch card and survey catch card holders as we have in the past to monitor the status of the Koocanusa bull trout population and fishery.

## INTRODUCTION

In 2018, Montana Fish, Wildlife & Parks (MFWP) personnel conducted the fifteenth annual angler mail survey for the recreational bull trout (*Salvelinus confluentus*) fishery on Lake Koocanusa. Because bull trout were listed as a “threatened species” under the Endangered Species Act in 1998, this fishery was authorized in 2004 under special permit by the U.S. Fish and Wildlife Service (USFWS).

In 2012, Montana Fish Wildlife & Parks decreased bull trout harvest from one per angler per year to catch and release for several reasons: 1) decreasing mean lengths of bull trout caught and harvested; 2) an unstable trend of redd numbers in the Wigwam River (the major spawning tributary in the BC portion Lake Koocanusa bull trout) and Grave Creek (the major spawning tributary in the US portion of Lake Koocanusa); 3) unknown amount of angler harvest in the mainstem and tributaries of the BC portion of Lake Koocanusa. We believed this was the prudent course of action even though the USFWS sub permit TE-077533 allowed for harvest of 1,140 bull trout. In 2015 MFWP determined that because redd numbers had stabilized then increased and BC further restricted angling regulations for bull trout, a limited (one bull trout/angler/year harvest) would be re-instituted for Lake Koocanusa during the 2016 season.

## BACKGROUND

Bull trout were listed as “threatened” under the Endangered Species Act in 1998. At the time of listing, sport fishing for bull trout had already been discontinued in Montana and was under review, except in Swan Lake which was considered to have a stable population.

The USFWS authorized an experimental sport fishery for bull trout at Lake Koocanusa because this fishery was deemed to have reached recovery levels. This activity was intended to benefit the species by researching the effects of restoring recreational fishing. In addition, allowing angling and limited harvest for bull trout likely increases public support for management of stable bull trout populations in the identified water bodies. We also believe the action will continue to garner additional support for restoration of bull trout habitats and other management activities that will improve bull trout populations throughout the state.

## METHODS

Conditions of the USFWS special permit (TE-077533) for a new bull trout fishery contained items agreed upon by both USFWS and MFWP (Hensler and Benson 2005). One condition called for the development and use of a catch card. Also required was a formal survey of anglers participating in these experimental bull trout fisheries. Educational materials were developed to explain catch card use, bull trout identification, seasons, limits, and regulations pertinent to each fishery and bull trout conservation measures.

The first step in developing a catch card authorization involved creating an application for anglers interested in fishing for bull trout. We made the form available through the Region 1 MFWP office and on MFWP’s web site. The application required the angler’s name, address,



automated licensing system (ALS) number, and permit area (waters) where they chose to fish. Anglers were not given duplicate catch cards during the season if the original was lost. To ensure consistent, high-quality information to and from participating anglers, we required that all applications be submitted to the Region One MFWP office in Kalispell. There has been no charge for the permit/catch card.

After a completed application was processed, a permit and numbered catch card were issued to each angler. The catch cards provided general instructions for anglers fishing for bull trout on Lake Koocanusa and requested that anglers keep the card until a survey was sent. The cards indicated entry of the catch zone, fish length, and date of catch for each fish harvested from Lake Koocanusa. Additionally, we requested supplemental information: total number of days fished for bull trout, total number of bull trout caught and released, and a catch and release log that included zone, length, month, and day.

We provided bull trout anglers a copy of the current bull trout fishing regulations and an informational pamphlet with each catch card issued. Pamphlets specifically outlined seasons, limits, restrictions, catch card use, catch-and-release fishing techniques, and bull trout identification for all waters open to bull trout fishing. Special license procedures, regulations, and conservation measures for bull trout were also itemized in the Montana Fishing Regulations booklets. As was previously described, anglers were allowed to harvest one bull trout during the 2018 season. Upon landing a bull trout, anglers were required to dispatch and harvest the fish or immediately release the fish.

Completed catch cards helped to provide information on bull trout harvest, catch date, size, and location through the 2018 season. We still do not charge a fee for catch cards or assess a penalty for failure to return cards as specified. We requested that anglers retain their catch card until surveyed and return the completed catch card with the survey to improve the reliability of information. A total of 443 catch cards were distributed to anglers for the 2018 season and surveys were mailed to catch card holders in early March 2019. By August, we concluded the survey due to declining returns.

We used the survey in combination with catch card returns to estimate the total number of bull trout harvested and released. All estimates and graphs were generated in Microsoft Excel. We conducted statistical analyses using Excel at a level of significance of 0.05 unless otherwise noted.

## **RESULTS**

### **Bull Trout Catch Card/Survey Returns**

Catch card instructions requested that anglers return the catch cards after their license expired with the mail survey. Some anglers returned catch cards but not surveys; some returned both; some returned only surveys. We issued 443 catch cards for the 2018 season and by August 2019, we received 319 catch cards/catch card surveys (72% return rate).

### **Angler Demographics**

The vast majority of anglers that obtained a Lake Koocanusa bull trout catch card for the 2018 season were Montana residents (93%). Anglers from 9 other states and provinces were issued a catch card for Lake Koocanusa. Non-resident anglers were from the states of California, Colorado, Idaho, Indiana, North Dakota, New York, Ohio, and the provinces of Alberta and British Columbia.

### **Fishing Pressure Estimates**

After the 2018 season, 163 of the respondents (51.1%) indicated that they did fish for bull trout. The percent of cardholders that fished began an upward trend likely associated with ability to harvest in 2016 (Figure 1). To estimate total number of angler-days of pressure on bull trout, we used the number of days reported from catch cards and surveys. We assumed anglers not responding to the survey angled for bull trout with the same effort as respondents. During the 2018 season, anglers reported fishing 703 days, and the estimate of total angling effort was 976 days (Table 1).

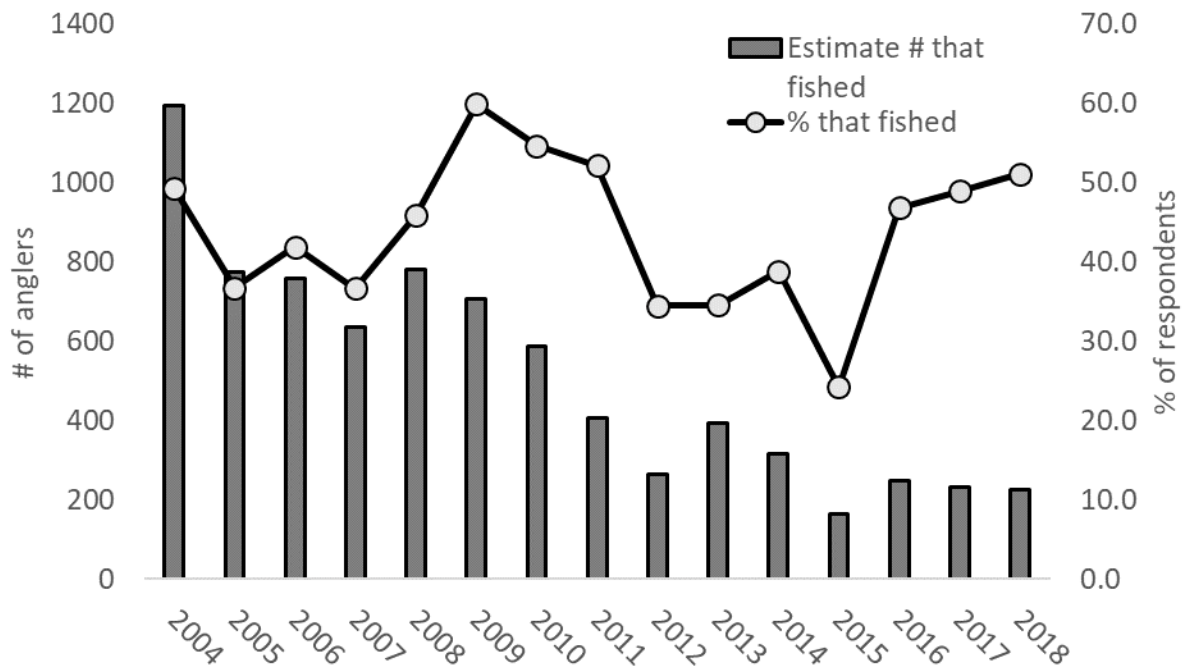


Figure 1. Estimated number of anglers and percent of respondents that fished for bull trout at Lake Koocanusa, Montana through the 2018 season.

Table 1. Bull trout season angling pressure estimates calculated from catch card and survey results for Lake Koocanusa through the 2018 season.

Number Angler-Days Fishing Pressure															
Season	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Number of Respondents	897	774	590	569	609	691	497	598	603	449	574	536	378	319	319
Angler-Days from survey	1,685	3,285	2,639	2,963	3,917	3,686	3,154	1,933	1,456	1,673	1,099	874	942	681	703
Estimated Angler-Days	3,483	4,874	3,390	3,595	4,607	4,537	3,720	2,521	1,850	2,370	1,842	1,202	1,326	1,008	976

## Harvest and Catch Estimates

To estimate total harvest at Lake Koocanusa for the 2018 season, we calculated the mean harvest rate (0.19 bull trout/angler) for anglers who returned catch cards and surveys. The estimated total harvest calculated from all surveyed anglers was 84 bull trout (Table 2). To estimate total catch at Lake Koocanusa for the 2018 season, we calculated the mean catch rate (2.06) for anglers who returned catch cards and surveys. The estimated total catch calculated from all surveyed anglers was 607 bull trout (Table 3). After harvest was re-instated in 2016,

anglers continued to harvest bull trout at a very low rate and much below the USFWS sub permit TE-077533 allowed for harvest of 1,140 bull trout.

Table 2. Estimated bull trout harvest (known harvest) and estimated catch (known catch) for Lake Koocanusa through the 2018 season.

Season	Bull Trout Harvested	Lower Bound	Upper Bound	Bull Trout Caught	Lower Bound	Upper Bound	Percent Released
2004	650 (259)	259	652	2,399 (698)	*	*	72.1
2005	371 (216)	216	373	3,595 (2,171)	2,171	3,611	89.7
2006	180 (140)	140	181	1349 (909)	909	1,353	86.6
2007	267 (220)	220	268	1,484 (997)	997	1,488	82
2008	295 (249)	249	296	1,897 (1,358)	1,358	1,900	84.4
2009	256 (206)	206	257	1,810 (1,247)	1,247	1,815	85.8
2010	163 (138)	138	164	1,568 (1,328)	1,328	1,573	89.6
2011	107 (82)	82	108	1,318 (925)	925	1,323	91.9
2012	No harvest			742 (608)	738	747	100
2013	No harvest			965 (728)	951	981	100
2014	No harvest			1,250 (746)	1,219	1,283	100
2015	No Harvest			973 (548)	927	1,019	100
2016	78 (55)	55	79	885 (575)	879	890	91.2
2017	68 (46)	46	69	607 (364)	603	611	87.4
2018	84 (31)	31	85	997 (336)	992	1003	91.6

\*Point estimate expanded from caught vs. released bull trout from catch cards with no variance calculated

We analyzed catch rates for anglers for all years. During the 2018 season, anglers reported the lowest number of bull trout caught and harvested on record (Table 3), although estimated catch and harvest was similar to recent years. The lower number of bull trout caught during 2017 and 2018 may be a response to decreasing numbers of anglers fishing for bull trout (Figure 1) as regulations limited harvest to one bull trout per year.

Table 3. Estimated annual bull trout caught and angler days per bull trout for anglers fishing in Lake Koocanusa through the 2018 season.

Season	Estimated Bull Trout Caught (reported caught)	Angler days per bull trout caught
2004	2,399 (698)	
2005	3,595 (2,171)	1.4
2006	1,349 (909)	2.5
2007	1,484 (997)	2.4
2008	1,897 (1,358)	2.4
2009	1,810 (1,247)	2.5
2010	1,568 (1,328)	2.1
2011	1,318 (925)	2.1
2012	742 (608)	2.4
2013	965 (728)	2.3
2014	1,250 (746)	1.5
2015	973 (548)	1.6
2016	885 (575)	1.6
2017	607 (364)	1.9
2018	997 (336)	2.1

### Catch Versus Harvest Length Estimates

We asked anglers to estimate and record lengths of bull trout they caught and released. For the 2018 season, mean length of harvested bull trout (27.7"; range 16"-31") was significantly larger (p-value < 0.001) than mean length of released bull trout (22.9"; range 10"-33"). While anglers caught and released bull trout of all size classes, harvest was targeted at larger bull trout (Figure 2). These patterns are consistent with data from previous years.

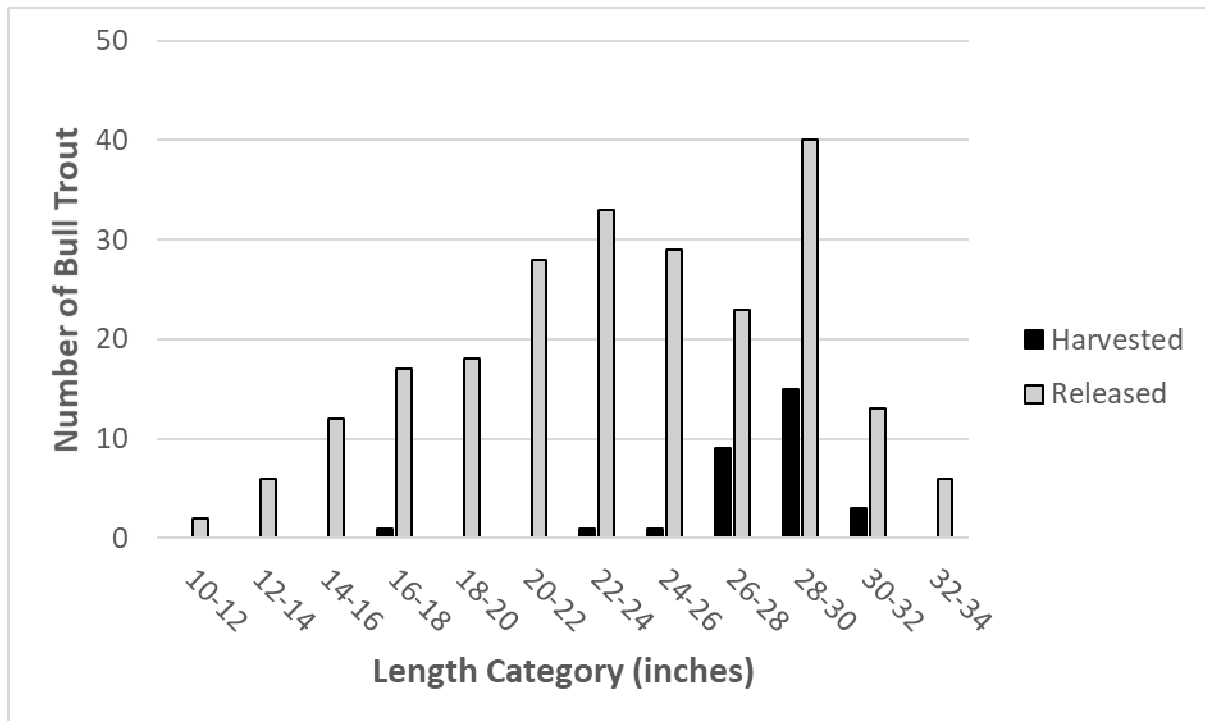


Figure 2. Length categories of bull trout harvested and released during the 2018 season from Lake Koocanusa, Montana.

### Bull Trout Redd Counts

Provisions of the USFWS sub permit TE-07735 authorized in 2004 for Koocanusa provided for angler take not to exceed 1,140 bull trout per year and stipulated that redd counts not drop below 667 for Wigwam River in British Columbia or 67 in Grave Creek. Since the experimental fishery began, estimated yearly harvest rates never approached permitted yearly harvest (Table 2) and even relatively liberal estimates for catch and release mortality (10.0%) only two years (2004,2005) resulted in the fishery exceeding 50 percent of the 1,140-fish take limit.

The Koocanusa bull trout population is closely monitored; one of the ways to monitor bull trout abundance trends is through annual fall redd counts. Bull trout redds are counted in index reaches of Wigwam River and its tributaries (Figure 3) annually by BC personnel, and in index reaches of Grave Creek and its tributaries (Figure 4) by MFWP personnel.

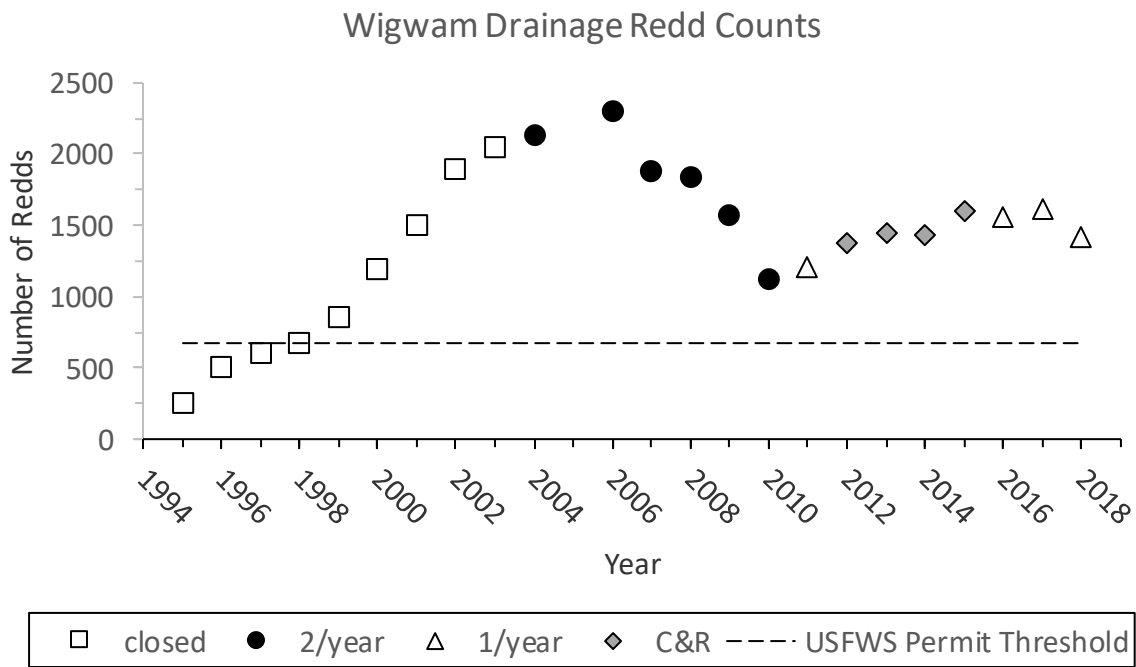


Figure 3. Bull trout redd counts for the Wigwam River drainage, British Columbia, Canada by Kootenai bull trout regulation.

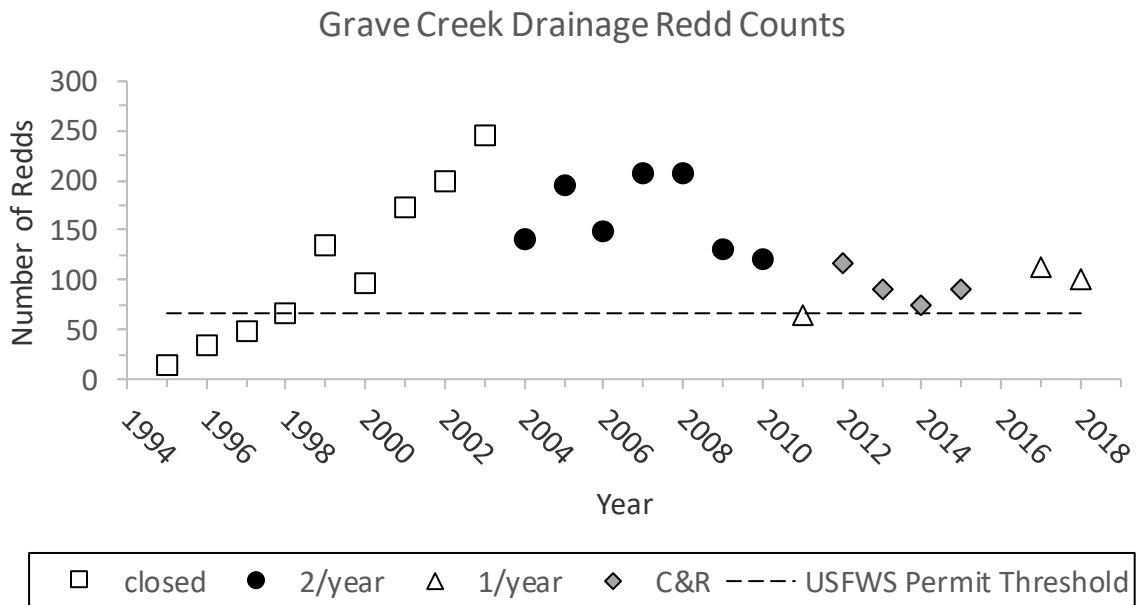


Figure 4. Bull trout redd counts for Grave Creek, Montana by Kootenai bull trout regulation.

These redd surveys have been conducted annually since 1995 except for Grave Creek in 2016 when high water made redd counts impossible. The 25-year dataset suggests a trend relationship exists between the number of bull trout redds and angling regulations at Kootenai. In addition, bull trout angling in the British Columbia portion of the Lake

Koocanusa/Kootenay River/Elk River system had relatively liberal harvest limits (1 >30 cm [12"] per day in Koocanusa and Kootenay River, 1 >75 cm (29.5") per day Elk River. Therefore, even though the harvest and redd count numbers did not approach permit thresholds, MFWP adjusted regulations after 2011 to one per year harvest and after 2012 to catch and release. Recent BC regulations include more restrictive limits (Bull trout release from Nov 1 through March 31 in Koocanusa and Kootenay River; No bull trout <75 cm) and with that in mind, MFWP requested a one bull trout harvest per year starting in the 2016 season.

### **Catch Card Violations**

We found 16 technical violations during the 2018 Koocanusa bull trout season; 14 catch cards were not notched for harvested bull trout and 2 catch cards were not signed. Though not egregious, the 14 catch cards not notched is troubling. We will remind anglers in the future to remember to accurately complete their catch cards and appropriately notch the catch card upon harvest of a bull trout.

### **CONCLUSION**

The Lake Koocanusa bull trout fishery is quite complex in that the majority of the adult population rears and matures in the Montana portion of the reservoir although major adult runs, spawning, and juvenile rearing occur in the BC portion of the drainage. Environmental and anthropogenic pressures are also complex and largely not known or measured. Over the years, MFWP developed a management strategy for the Lake Koocanusa bull trout recreational fishery that evolved to be more conservative than the limits of the authority statutes set by USFWS sub permit TE-07753 for this population. As a result, regulations have been modified from harvest of two bull trout per year to catch and release and back to harvest of one based on the gathered information.

It is problematic to identify and measure all possible variables (environmental/anthropogenic) affecting the bull trout population in Lake Koocanusa. Adding to the complication, one-half of the reservoir is across an international border with additional environmental variables and different management schemes for bull trout. Regardless, given the data (redd counts, angler counts, harvest/catch and release counts) we have gathered since 2004 and analyses of these data we believe a return to limited bull trout harvest (one per year) in 2016 was and is still appropriate. We will continue require a catch card and survey catch card holders. We expect that re-establishing a conservative bull trout harvest will continue to help provide additional opportunity to further monitor the status of this unique fishery.

In 2016, MFWP closed angling on Grave Creek and its tributaries upstream of the highway 93 bridge from August 15 until the third Saturday in May to provide additional protections for migrating adult bull trout. We have very good relations with our counterparts in British Columbia and we continue to share data and ideas that will help inform and improve future management decisions.



### **LITERATURE CITED**

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